

## PATENT ABSTRACTS OF JAPAN

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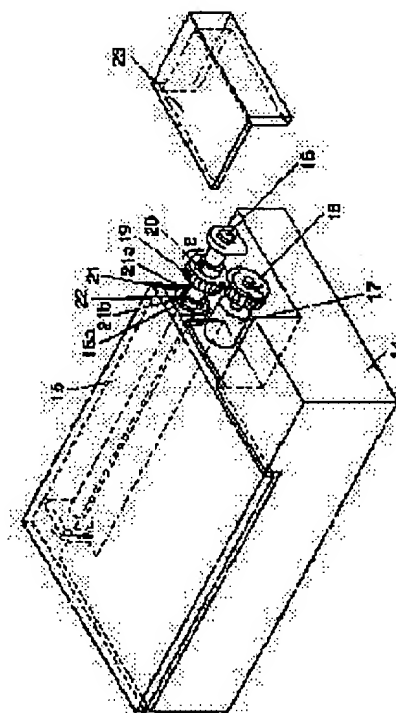
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## (54) IMAGE READER

## (57)Abstract:

PROBLEM TO BE SOLVED: To easily perform the document replacing work in a short time with respect to an image reader which reads a picture written in a document, a magazine, or the like.

SOLUTION: A motor 17 to open a document cover 15 gears 18 and 19 and a shaft 16 which are a rotation transmission part to transmit the rotation of the motor 17, and a torque limiter 21 which transmits the rotation from the shaft 16 to the document cover 15 are provided, and the motor 17 is rotated at a set angle to automatically open the document cover 15 after the end of image read or image copy, and thus, the document replacing work is simplified, and the document replacing time is shortened because the time from the end of image read or image copy to opening of the document cover 15 is made shorter in comparison with operator's opening of the document cover 15. Since the torque limiter 21 is used, the operator can open and close the document cover 15 by himself or herself if necessary.



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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The perspective view of the image reader of the gestalt 1 of operation of this invention

[Drawing 2] The perspective view of the torque limiter used for this image reader

[Drawing 3] The outline sectional view showing the closing motion lid pivotable support section in this image reader

[Drawing 4] The sectional view showing the configuration of the drive system of this image reader

[Drawing 5] The outline sectional view showing the configuration of the conventional image reader

[Drawing 6] The appearance perspective view of this image reader

[Description of Notations]

1 Manuscript Glass

3 First Carriage

6 Mirror

7 Second Carriage

8 Mirror

9 Mirror

13 Detection Member

14 Body of Image Reader

15 Manuscript Lid

16 Shaft

17 Motor

18 Gear

19 Gear

20 Stop Screw

21 Torque Limiter

21a Container liner

21b Outer case

21c Slit

22 Pin

23 Covering

24 Stopper

25 Shaft

26 First Carriage Drive Gear

27 Second Carriage Drive Gear

28 First Carriage Driving Belt

29 Second Carriage Driving Belt

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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image reader which reads the image indicated by the manuscript, the magazine, etc.

[0002]

[Description of the Prior Art] From the former, a manuscript, a magazine, etc. are laid on manuscript glass for the image read of a scanner and a copying machine, and the image reader which reads an image is used widely.

[0003] It explains referring to a drawing about the conventional image reader below.

[0004] The outline sectional view in which drawing 5 shows the configuration of the conventional image reader, and drawing 6 are the appearance perspective views of the conventional image reader.

[0005] This image reader had manuscript glass 1 which lays a manuscript in the upper part, as shown in drawing 5 and drawing 6, and it arranges it for the manuscript lid 2 which presses down a manuscript on it, enabling free closing motion. It is the interior of this body 14 of an image reader, and under the manuscript glass 1, the first carriage 3 is arranged so that it can run, and lamps 4 and 5 and a mirror 6 are attached in the first carriage 3. Moreover, inside the body 14 of an image reader, the second carriage 7 is arranged so that it can run, and mirrors 8 and 9 are attached in the second carriage 7. And the light from the second carriage 7 converges with a lens 10, and has composition which carries out incidence to the optical coupling element 11 which changes the strength of light into an electrical signal. In addition, for 12 in drawing, the optical path from a manuscript to an optical coupling element 11 and 13 are [ the first carriage of a read starting position and the second carriage, and 3B and 7B of a detection member, and 3A and 7A ] the first carriage and the second carriage of a read termination location.

[0006] Thus, actuation of the constituted conventional image reader is explained. A manuscript is laid on manuscript glass 1 and illuminated with lamps 4 and 5. 90 degrees reflects by the mirror 6 and 90 degrees of light reflected from the manuscript are further reflected by 90 degrees and the mirror 9 by the mirror 8. Then, light converges by passing along a lens 10, and goes into an optical coupling element 11. The strength of the light to which each component of the optical coupling element 11 prepared 400-600 pixels per inch is proportional to the shade of a manuscript about one line of read is changed into the size of an electrical signal. thus, a manuscript -- it reads the image of one line at a time. In order to perform read actuation per line from the tip of a manuscript to the back end, actuation which the first carriage 3 reads in a read starting position, and moves to a termination location, and the second carriage 7 moves to it and coincidence at the rate of the one half of the first carriage 3 is performed. An operator opens the manuscript lid 2 after image read termination or image copy termination, and exchange of a manuscript takes out the manuscript on manuscript glass 1, and is performed by laying the following manuscript.

[0007]

[Problem(s) to be Solved by the Invention] However, with the configuration of the above-mentioned conventional image reader, after image read termination or image copy termination, the operator had to

open the manuscript lid 2 by himself, manuscript exchange had to be carried out, and the problem that a manuscript exchange activity was troublesome had occurred. Moreover, since some time amount passed after image read or an image copy was completed when, or an operator understands and \*\*\*\*\* (ing), image-read-ending or image copy ending before opening the manuscript lid 2, it had the trouble that manuscript swap time became long.

[0008] This invention solves the above-mentioned conventional trouble, a manuscript exchange activity is done simple, and it aims at offering the image reader which enabled it to shorten manuscript swap time.

[0009]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, this invention is the configuration that a motor opens a manuscript lid, it prepares a torque limiter in the rotation transfer system to said manuscript lid, and when said motor carries out setting include-angle rotation after image read termination or image copy termination, it uses it as the image reader which said manuscript lid opened.

[0010] According to this invention, a manuscript exchange activity can be done simple and the image reader which enabled it to shorten manuscript swap time can be obtained.

[0011]

[Embodiment of the Invention] A motor for invention of this invention according to claim 1 to open a manuscript lid and said manuscript lid, It has the torque limiter prepared in the rotation transfer system from the rotation transfer section which transmits rotation of said motor, and said rotation transfer section to said manuscript lid. It is the image reader which said manuscript lid opened when a motor carried out setting include-angle rotation after image read termination or image copy termination. When said rotation transfer section and said torque limiter rotate, in order that said motor may carry out setting include-angle rotation after image read termination or image copy termination and said manuscript lid may open automatically in connection with it, A manuscript exchange activity is done simple and it has an operation that manuscript swap time can be shortened.

[0012] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

[0013] (Gestalt 1 of operation) The perspective view of the torque limiter by which the perspective view of the torque limiter by which drawing 1 is used for the perspective view of the image reader of the gestalt 1 of operation of this invention, and drawing 2 is used for this image reader, and drawing 3 are used for this image reader, and drawing 4 are the sectional views showing the configuration of the drive system of this image reader. In addition, in said drawing, the same number is attached about the same components as said Prior art, and the explanation is omitted.

[0014] drawing 1 - drawing 4 -- setting -- 1 -- for a mirror and 7, as for a mirror and 13, the 2nd carriage, and 8 and 9 are [ manuscript glass and 3 / the first carriage and 6 / a detection member and 14 ] the bodies of an image reader. In addition, although not illustrated, the lamp is attached in the first carriage 3, and the light from the second carriage 7 converges with a lens, and has composition which carries out incidence to the optical coupling element which changes the strength of light into an electrical signal. Moreover, the first carriage of a read starting position and the second carriage, and 3B and 7B of 3A and 7A are the first carriage and the second carriage of a read termination location. These configurations have the same composition as said Prior art (refer to drawing 4 ).

[0015] The image reader of the gestalt 1 of this operation has the description in the configuration described below. That is, the manuscript lid 15 is supported pivotably by the shaft 16 and the edge is supported pivotable. He is trying for the motor 17 for opening the manuscript lid 15 attached in the body 14 of an image reader to transmit rotation of a motor 17 to said shaft 16 through the gear 19 attached in the shaft 16 from the gear 18 which is the rotation transfer section attached in the output shaft. In addition, the gear 19 is being fixed to the shaft 16 with the stop screw 20. Moreover, said motor 17 and the gear 18 of the rotation transfer section, and 19 grades are covered with covering 23 (refer to drawing 1 ).

[0016] The torque limiter 21 is formed in said shaft 16. It has container liner 21a and outer case 21b, and the pin 22 fixed to the shaft 16 is specifically clenched by slit 21c formed in that container liner 21a,

therefore this torque limiter 21 is united and rotates container liner 21a and a shaft 16 (refer to drawing 2 ). Moreover, outer case 21b is pressed fit in rotation supporter 15a of the manuscript lid 15, and outer case 21b and the manuscript lid 15 are united, and rotate. Said manuscript lid 15 suspends the disconnection at a fixed include angle with a stopper 24 (refer to drawing 3 ).

[0017] Said first carriage 3 and second carriage 7 are supported free [ sliding ] with the shaft 25, in order to read in the read starting positions 3A and 7A and to run to the termination locations 3B and 7B. The drive system of said first carriage 3 and second carriage 7 The first carriage drive gear 26, the second carriage drive gear 27, and the first carriage driving belt 28 that it rotates [ driving belt ] by the first carriage drive gear 26, and makes the first carriage 3 reciprocate, It is constituted by the second carriage driving belt 29 which it rotates [ driving belt ] by the second carriage drive gear 27, and makes the second carriage 7 reciprocate, and each driving belt 28 and 29 is fixed to the first carriage 3 in the place of 3a, and is being fixed to the second carriage 7 in the place of 7a. Here, the second carriage 7 can be moved at the rate of the one half of the first carriage 3 by making the pitch diameter of the second carriage drive gear 27 into the one half of the pitch diameter of the first carriage drive gear 26 (refer to drawing 4 ).

[0018] About the image reader constituted as mentioned above, the actuation is explained below. First, actuation of a torque limiter 21 is explained using drawing 2 . Between container liner 21a and outer case 21b, within setting torque, turning effort is transmitted, if the force exceeding setting torque acts, the transfer force will be intercepted, and the torque limiter 21 is constituted so that container liner 21a and outer case 21b may rotate separately.

[0019] Next, image read actuation and the switching action of the manuscript lid 15 are explained. When doing an image read activity or an image copy activity, after an operator opens the manuscript lid 15 which is in the condition of having closed, first and lays a manuscript on manuscript glass 1, he shuts the manuscript lid 15. Since the torque limiter 21 is used for the rotation transfer on the manuscript lid 15 from a shaft 16 at this time, the manuscript lid 15 can be opened [ a motor 17 can stop and ] and closed also in the condition that a shaft 16 does not rotate, by adding the torque beyond the setting torque of a torque limiter 21. Next, an image read activity or an image copy activity is done. At this time, as shown in drawing 4 , the first carriage 3 and the second carriage 7 move along with a manuscript, and after the first carriage 3 arrives at the location of 3B, the second carriage 7 arrives at the location of 7B and image read actuation is completed, the first carriage 3 and the second carriage 7 begin to return toward original read or an original image copy starting position (3A, 7A) again. Then, the second carriage 7 is detected by the detection member 13, and the first carriage 3 and the second carriage 7 are read, or it is stood still in an image copy starting position (3A, 7A). The detection signal at this time is read and the setting include-angle rotation of the motor 17 is made to carry out in the direction of arrow-head A. In connection with it, in the direction of arrow-head B, container liner 21a of a gear 19, a shaft 16, and a torque limiter 21, outer case 21b, and the manuscript lid 15 are united, and rotate.

[0020] The above actuation opens the manuscript lid 15 the degree of setting angle. When the manuscript lid 15 opens, the manuscript lid 15 is held in the condition of having opened, by holding power, such as detent torque of a motor 17. An operator takes out the manuscript on manuscript glass 1, after the manuscript lid 15 has opened, he lays the following manuscript, and shuts the manuscript lid 15. And an image read activity or an image copy activity is done after that. Here, since the stopper 24 of drawing 3 is formed even when the manuscript lid 15 is opening a few at the time of image read, the manuscript lid 15 is not opened more than a fixed include angle.

[0021] As mentioned above, with the gestalt of this operation, after image read termination or image copy termination, when a motor 17 carries out setting include-angle rotation and the manuscript lid 15 opens automatically, it becomes unnecessary for an operator to open the manuscript lid 15, and a manuscript exchange activity becomes simple. Moreover, since the torque limiter 21 is used for the rotation transfer on the manuscript lid 15 from a shaft 16, an operator can open if needed and close the manuscript lid 15. Furthermore, time amount after image-read-ending or image copy ending compared with the case where an operator opens the manuscript lid 15 by himself when the manuscript lid 15 opens automatically immediately after image read termination or image copy termination until it opens

the manuscript lid 15 becomes short.

[0022]

[Effect of the Invention] A motor for this invention to open a manuscript lid so that more clearly than the above explanation, It has the torque limiter which performs the rotation transfer on a manuscript lid from the rotation transfer section which transmits rotation of a motor, and the rotation transfer section. After image read termination, Or when a motor carries out setting include-angle rotation after image copy termination and a manuscript lid opens automatically A manuscript exchange activity becomes simple, and further, when an operator opens a manuscript lid by himself, it compares. Time amount after image-read-ending or image copy ending until it opens a manuscript lid becomes short, manuscript swap time can be shortened, and it divides, and the effectiveness is large when it is two or more manuscripts.

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[Translation done.]